**NSLS Environmental Awareness for Water Systems**
**(Regeneration of Mixed Bed Deionizer for NSLS Process Water Systems and Cooling Water System Maintenance)**
**(Course Material)**

LS-ENV-WAT

**Instructions:** Read the material below and then close this document. You will receive credit for training through the BNL training system.

**Course Objective:** The regeneration of the mixed bed resin deionizers and maintenance of the cooling water systems (HVAC systems including the cooling tower) have significant environmental aspects associated with their operation. This course has been designed to provide you with the job-specific information that you need know to protect the environment and to meet Laboratory and Government regulations for handling hazardous wastes. The contents of this training have been extracted from the NSLS PRM and BNL Subject Areas.

**Description of Significant Environmental Aspect:** The regeneration of the deionizers results in the generation of industrial and hazardous wastes and liquid discharges that need to be controlled. Corrosion products in the process water systems result in the build up of metals in the filters. The regeneration process results in heavy metal release into the regeneration waste waters, potentially at levels that meet the definition of hazardous or industrial waste.

Maintenance of the cooling water systems involves discharges of cooling water to the sanitary and storm water systems. The water in the cooling tower system contains anti-corrosion and anti-foulant chemicals.

**Authorization Requirements:** Only personnel authorized by your supervision are allowed to work unsupervised on regeneration of the deionizer or the cooling systems. As a minimum, such authorization requires the completion of job specific training established by your supervision, including this specific environmental awareness training.

**Operational Controls:** System specific procedures have been developed to ensure proper regeneration and handling of the waste water produced by the mixed bed regeneration process. These procedures should always be used by personnel when regenerating the mixed bed resin deionizers. Always contact your supervision if you have questions about the procedure.

Cooling water may be directly discharged to sanitary or storm drains under normal conditions. You should be aware that if process problems are suspected to have caused water to become contaminated, or if water has an abnormal odor or color, it should be collected and sampled prior to discharge. Only qualified sampling technicians from the Environmental Services Division may conduct sampling for waste characterization. Environmental sampling is to be coordinated through the ECR.

**Response to Leaks:** Technicians and engineers who are responsible for operating deionizing systems during regeneration should be sensitive to leaks to floor drains or other discharge points to the environment. Minor spills should be reported to your supervisor after taking steps to avoid discharge to drains. Major leaks should be secured to the extent possible and reported to the NSLS Control Room Operator (x2550) and Lab emergency response number (x2222) as soon as possible so that Sewage Treatment Plant and Environmental personnel can be prepared for potential impacts at the Sewage Treatment Plant.

Leaks from the cooling systems may discharge to either the sanitary or storm system, unless contamination is suspect as described above.

**Your Role and Responsibility:** As a member of the operating group for the NSLS deionizer systems and cooling systems, it is important that you follow the procedures and other instructions established by your

supervision and take prompt action in the event of spills. If you are ever in doubt regarding the proper course of action, contact your supervision or a member of the NSLS ESH Staff.

**Potential Regulatory and Environmental Impacts:** Discharge of the waste water without confirmation of metal concentrations or pH level can result in violations of BNL release limits and RCRA hazardous waste regulations, and potentially result in contaminated soil or groundwater. In addition, improper drum storage of waste water can result in a violation of Suffolk County storage regulations. BNL is subject to fines and penalties for such violations, and is responsible for the clean-up costs associated with any required remediation.

**Pollution Prevention and Waste Minimization:** Please offer suggestions and comments to your supervision about pollution prevention and waste minimization. Recent efforts to reduce waste generation in this system include the use of pre-deionized make-up water to lower the frequency of resin bed regeneration. Other ideas may help continue this type of waste minimization.